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Conventional-Report Nephanalysis

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"This technical report has been reviewed and is approved for publication"

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Conventional-report Nephanalysis is the construction of large-scale representations of cloud distribution by the use of surface-based observations. It is complementary - and perhaps subsidiary - to nephanalysis by the interpretation of satellite imagery, but can serve a vital function by providing reference fields against which the results of satellite-data processing algorithms may be evaluated. In this document is described an implementation of AFGWC's conventional-report processor which was developed at AFGL for use on the AFGL Interactive Meteorological System. Two sets of conventional reports from the canonical case-study days 82162 (Summer; 21:00 UT) and 85010 (Winter; 00:00 UT) were processed, for comparison against AFGWC's nephanalysis, AFGL's satellite-data nephanalysis, and cloud truth.

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Contents

Figures

Table

The Conventional Reports

Cloud layer data from surface observers, aircraft observers, and radiosondes – the so-called *conventional reports* – are collected from stations worldwide for incorporation into AFGWC's nephanalysis algorithms. Conventional reports are valuable because they consist of direct observations of cloud information, whereas satellite fields are derived from infrared or visible-light imagery, and suffer from various sources of confusion [1,2].

The conventional reports, particularly those relayed by human observers, are detailed and can be highly accurate. They contain such information as cloud types, cloud amounts (expressed as a per cent of sky coverage), altitudes of cloud bases and tops, the WMO-coded present weather, visibility, and the *total cloud*, a composite value, again expressed in per cent. Appendix *A* contains examples of conventional reports.

Conventionally-derived reports complement satellite results in the sense that they consist of cloud layer tabulations as observed *from the ground up*, so that the lowest cloud layer is unobscured, with a potential for greater obscuration at successively higher layers. Space-based observations, on the other hand, suffer from the converse problem, with the highest layers having been *least* obscured.

Conventional reports are also inherently *local*, and relatively few in number, and their relatively sparse geographic coverage makes it difficult to obtain large-scale estimates of cloud cover by using them alone. There are a total of 5285 conventional reports over the northern hemisphere in the case study data set for JD 82162 (11 June 1982), and 4511 in the data set for JD 85010 (10 January 1985). The majority of these are derived from the populous and developed regions of the world, particularly Europe (Neph Boxes 29, 30, and 38, with 33% of the total hemispheric reports for JD 82162 and 28% of those for JD 85010), the Far East (Neph Boxes 12, 19, 20, and 21, with 23% of the total reports for JD 82162 and 29% for JD 85010), and the continental United States (Boxes 43, 44, 45, and 52, with 21% of the total reports for JD 82162 and 24% for JD 85010). The highest concentration of reports is in central and eastern Europe, with 14% of the *total hemispheric reports* for each of the case-study data sets occurring in this single neph

box. Even here, however, only one in six of the 4096 grid points in the Neph Box has an observation associated with it.

In order to supplement satellite-derived fields with plausible representations of large-scale cloud cover using the sparse conventional data, the mechanism of conventional-report propagation was introduced. The rationale was as follows: since, under some conditions, a surface observer's visibility is greater than the 25 nautical mile nominal extent of a grid box, it should be valid to propagate a conventional report into neighboring (empty) grid boxes, where actual conditions are likely to be similar to those at the observed point. Furthermore, it is *vital* to do so, if reasonably complete representations of cloud cover are to be generated from the conventional reports alone. Thus, conventional-report propagation has been a part of the AFGWC automated nephanalysis since its inception.

The AFGWC Conventional-Report Processor NEFMRG

The AFGWC conventional-report processor combines cloud layer information from conventional reports with cloud fields estimated from infrared or visible-light satellite sensors. These observations are weighted using various criteria, and are merged into the previously-generated nephanalysis, overwriting it at any points where new information exists. The output analysis thus consists of observations of various ages and sources, intermixed on a gridpoint-by-gridpoint basis.

An additional function of AFGWC's NEFMRG is to perform conventional-report propagation after inserting the conventional reports themselves, but before merging the satellite fields. The rules governing this propagation have not been static over time: more about this later.

NEFMRG is a real-time processor, generating updated nephanalyses many times per day. The program itself, along with the rest of AFGWC's nephanalysis package, has existed in at least two distinct forms. The first, known as the 3DNEPH (3 Dimensional NEPHanalysis) tabulates cloud cover in up to fifteen fixed-height layers, ranging from the surface to 55000 feet. The 3DNEPH was superseded by the RTNEPH (Real-Time NEPHanalysis) package on JD 83212. The RTNEPH represents cloud decks with up to fou "floating" layers (having variable bases and tops), and maintains separate time history and origin flags for each layer.

Currently, we do not have the 3DNEPH propagation algorithms. We model them as a parameterized version of the RTNEPH algorithm, inferring the parameters by comparing the propagated conventional reports with the AFGWC-supplied nephanalysis for the same data set.

The AFGL Conventional-Report Processor RDMRG

AFGL's RDMRG (Research and Development MeRGe Processor) simulates the conventional-report propagation of both 3DNEPH-style and RTNEPH-style data. In each case, the reports are merged into a null persistence analysis and propagated. The resulting conventional-report nephanalysis is displayed and written to disk in the appropriate analysis-file format (either fifteen fixed layers in a 3DNeph simulation, or four floating layers with ancillary information in an RTNeph run).

The RDMRG is structured as a set of high-level modules which manage the processing and which actually implement the report propagation, supplemented by two sets of auxiliary, data-type-specific routines which handle the details of data representation. In this way, the propagation algorithm can be modified and then exercised on one or both of the data formats, as long as the appropriate type-specific routines are available.

Like the satellite processor, the RDMRG utilizes terrain-height and geography-type fields. The terrain-height representation is unchanged over the time span encompassing our case-study data sets, whereas for the geography-type field, coastal ice varies seasonally from the summer and winter data. The formats of these files have been invariant, allowing them to be accessed by the high-level modules.

Conventional-Report Propagation

There is little *a priori* justification for the propagation of conventional reports, because the field of view available to a surface observer is dominated by the conditions at his or her own grid box. Geometrical arguments show that the elevation angles of cloud in neighboring grid elements are no more than a few degrees from horizontal. However, weather patterns are often large-scale structures in comparison to an eighth-mesh grid element, and an argument for propagation can be made by examining maps of the conventional reports, isolating adjacent pairs of reports, and comparing the number of pairs having the *same* total cloud versus the number of pairs with *differing* total cloud. As an example, for adjacent-report pairs in Box 45, for both case-study data sets, the ratio of *similar* to *dissimilar* total cloud is approximately 6/4.

The propagation algorithm utilized by NEFMRG and emulated by RDMRG is straightforward. Conventional reports are "spread" – replicated into – empty neighboring grid boxes that lie within a radius of one, two, or three grid boxes from the initializing report. In theory, the actual "spread radius" depends on the altitude of the lowest observed cloud layer, so that reports with low cloud are propagated less than those with high cloud. In practice, the spread radii seem to have been specified to be *independent* of the altitude of the lowest cloud, although for JD 82162, reports with *no* cloud (clear skies) seem to have been propagated more than cloudy reports.

The local geography also plays a part in the spreading process: the propagation of low cloud may be blocked by high-lying terrain in neighboring grid boxes, and propagation is performed only minimally across land/water boundaries.

The spread radii utilized by NEFMRG, in effect during the processing of the case-study data and replicated within RDMRG, are tabulated on the next page (Table 1). The values for JD 82162 are not directly available, so they have been inferred from AFGWC's nephanalysis. In the table, *LCB* is the Lowest Cloud Base.

The patterns that result from spreading an isolated conventional report by a fixed radius are characteristic. For radii of one, two, and three grid boxes, they are:

```
                                              *
                           *              * * * * *
                 *       * * *            * * * * *
*    ==>       * * *   * * * * *        * * * * * * *
                 *       * * *            * * * * *
                           *              * * * * *
                                              *
```

These and combinations of these can be seen in AFGWC nephanalysis-output fields.

TABLE 1 Spread Radii, in eighth-mesh grid points, for the Summer and Winter case-study days

Action	82162	85010
Spread coast to land	1	1
Spread sea to land	1	1
$LCB < h_1$	2	3
$h_1 < LCB \le h_2$	2	3
$h_2 < LCB$	2	3
Spread *Clear* Report	3	3
Spread w/ *Missing LCB*	1	3
h_1 (low/mid cloud delimiter)	2000	2000
h_2 (mid/high cloud delimiter)	5000	5000

Case Study Data Set Propagation

For both case study days, the conventional reports for Box 45 were propagated using AFGL's RDMRG, and the results were compared with the appropriate AFGWC nephanalysis output. This process demonstrates the kind of results to be expected from conventional-report nephanalysis and highlights some of the differences in the way the conventional reports and satellite fields had been merged by AFGWC's 3DNEPH and RTNEPH.

Figure (1a) depicts the geography field for Box 45, which includes the north-eastern United States and Canada. For the two case-study days, this field varies only slightly, in the distribution of offshore ice at high latitudes.

The next figure (1b) displays the conventional reports' total cloud field for the summer case-study data set. There are 267 surface observations and four aircraft-pilot reports. Note that the reports cluster in the populous coastal regions.

The effects of the spreading process, using the spread parameters from Table 1, are show.. in (1c). While isolated reports are spread into characteristic star-like patterns, a virtually complete nephanalysis results for the well-reported coastal regions. For comparison, AFGWC's composite nephanalysis, generated by the (missing) 3DNEPH merge algorithm, and including cloud fields derived from satellite data as well as conventional reports, is shown in (1d). A comparison of (1c) and (1d), looking for evidence of conventional-report spreading in AFGWC's nephanalysis, shows that for this case, spreading occurred more over water than over land. Note the characteristic star-like artifacts in the southern and eastern areas, whereas in the west, which is predominantl·· land, the conventional reports themselves are frequently overwritten, presumably by satellite fields. Overall, the influence of the conventional reports on this analysis field seems to have been minimal.

A far more complete picture of the conventional-report assimilation process emerges from the winter case-study day, because there exist point-by-point time history and data-origin flags in the RTNEPH output analysis. First, (2a) shows the 218 conventional reports for case-study day 85010. The distribution is similar to that for 82162.

The results of the RTNEPH spreading process, using the parameters from Table 1, are shown in (2b). Although there are fewer reports than in the summer-day case, the larger spread radius results in more extensive coverage. The next figure (2c) shows a subset of AFGWC's nephanalysis. The displayed grid points are those with either the *conventional-report* or *spread-to* flag set in the data origin-words associated with each RTNEPH grid point. (Note that these points may have been *influenced* by satellite-derived information: the flags referred to simply indicate the influence of conventionally-obtained data as well.) Although some of the points in this field have been retained from the previous nephanalysis (as can be seen by examining the time-history words), the resemblance between this field and (2b) is striking. This suggests a far greater reliance on the conventional reports by the RTNEPH merge algorithm than by the 3DNEPH: compare again (1c) and (1d).

Figure (2d) is the complement of (2c), in that all displayed grid points are derived from satellite data only. Note that the texture of this field can be finer than conventional-report fields, as in the southeastern corner, because of the high visual resolution of satellite imagery and because conventional report fields are heavily dependent upon spreading. RTNEPH's complete nephanalysis is shown in (2e).

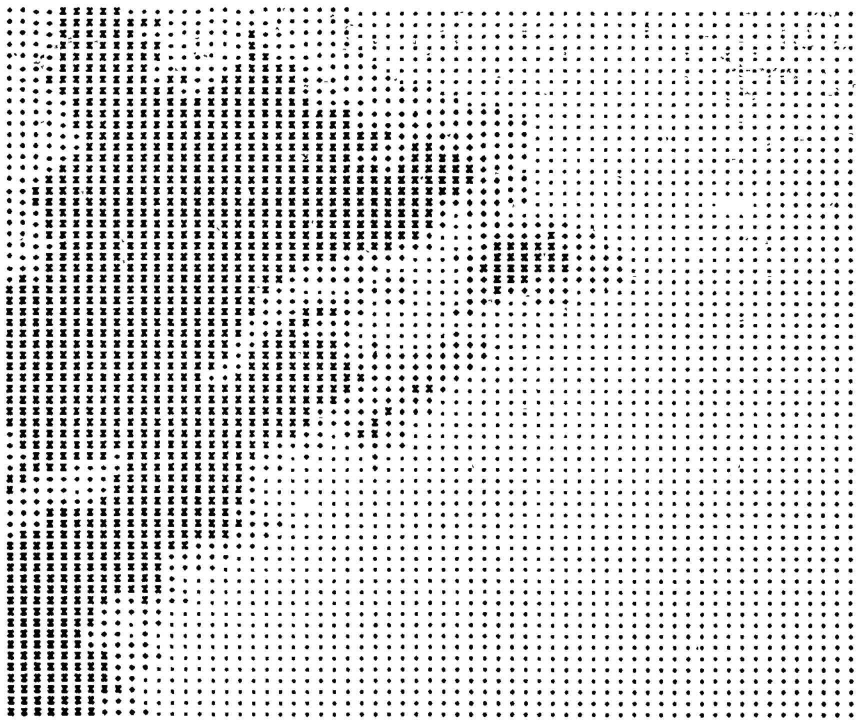

Figure 1a. The geography field for Box 45 on the summer case-study day 82162. Small and large dots represent water and ice, respectively, + indicates coast, and X is land. The figure extends from the mid-Atlantic states through New England into Canada. Cape Cod, Nova Scotia, New Brunswick, the St. Lawrence Seaway, Lake Ontario and the eastern edge of Hudson Bay are all visible.

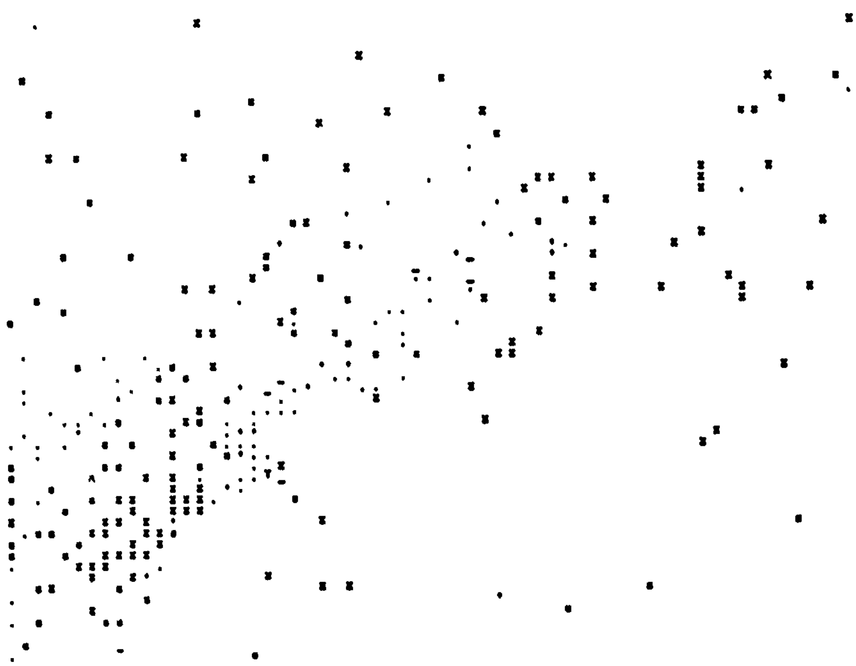

Figure 1b. The conventional reports. Total cloud is represented in fourths, with _ ==> 0/4, . ==> 1/4, * ==> 2/4, x ==> 3/4, and X ==> 4/4. Reports originating over water are from ships.

Figure 1c. The propagated conventional reports.

Figure 1d. For comparison, AFGWC's composite nephanalysis for 82162, including satellite-derived fields as well as conventional data. Here, clear gridpoints are represented using blanks.

Figure 2a. The conventional reports for the winter case-study day 85010.

Figure 2b. The propagated conventional reports.

Figure 2c. The conventional-report-influenced component of AFGWC's composite nephanalysis for 85010. The displayed points have either the <u>conventional-report</u> or <u>spread-to</u> flag set in the data origin word associated with each grid point. Note that there are points displayed here which do not appear in (2b). These result from conventional reports which were processed in a previous nephanalysis cycle, and which are not yet old enough to be discontinued. (This can be verified from the time flag returned in the analysis – see Appendix B).

Figure 2d. The satellite-data component of AFGWC's output nephanalysis for 85010. This figure is the complement of the previous figure.

Figure 2e. AFGWC's composite nephanalysis for 85010.

Conclusion

The complementary nature of surface and satellite observations suggests two areas for further study involving the conventional reports. First, a statistical analysis of layer frequencies could be performed, as has been done for satellite-derived fields[(3)]. Second, at grid points where the conventional reports and the satellite results differ, a detailed analysis of the satellite processor's cloud-field extraction algorithm should be made, possibly with emphasis on the cloud/background thresholding algorithm.

Possibly there ought to be more interplay between the conventional reports and the SGDB within the satellite-data algorithm. At grid points where conventional reports show non-overcast conditions (total cloud ≤ 75%) it might be worthwhile to compute a local cloud/no cloud threshold value from the data in the SGDB, and utilize this threshold when generating the RGS maps. For example, when there is a *clear* total cloud report, the typical SGDB pixel value should define the appropriate local threshold value, whereas for 50% total cloud, the warmest 50% of the SGDB pixels can be used to set the threshold. An overcast report is not helpful for this type of analysis, since most or all of the associated pixels should be at a similar non-background temperature.[1]

It may, additionally, be worthwhile to propagate these thresholds in a manner similar to that currently performed for the conventional reports themselves, if the underlying skin temperatures show less point-by-point variation than do typical cloud fields.

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[1]A very cursory comparison between the SGDB and corresponding conventional reports shows that for this approach to be valuable, the surface and satellite observations must be closely correlated in time. Also, the total cloud field of the conventional reports is not always consistent with the reports' own layer information. In such cases it will be necessary to make some kind of judgement as to which information is more valid.

Appendix A – The Conventional-Report Data

The following pages contain the conventional-report data for Box 45 for both case-study days.

3DNeph Best Reports for Box 45

Box	i	j	Julian Hour	Min	RPT TYP	Terrain El(MSL)	FW	MAX TOP	MIN BAS	TOT %	CLD TYP L	M	H	% COV (above Terrain) 1	2	3	4	5	6	% COV (above Mean Sea Level) 1	2	3	4	5	6	7	8	9
1	45	1	34	120645	0	4	7	0	66	50	75	0	0	0	0	0	0	0	0	0	0	25	75	75	75	0	0	0	0
2	45	1	45	120645	0	4	7	0	50	36	25	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	26	0
3	45	1	47	120645	0	4	6	3	61	76	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0
4	45	1	48	120645	0	4	11	0	77	74	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	76	0
5	45	1	50	120645	0	4	12	0	50	30	75	0	0	0	0	0	0	0	0	75	75	75	75	0	0	0	75	75	0
6	45	1	52	120645	0	4	11	0	79	35	100	3	0	0	0	0	0	0	0	0	25	25	0	0	0	0	101	101	0
7	45	1	54	120645	0	4	10	0	75	40	75	0	0	0	0	0	0	0	0	0	0	75	75	0	0	75	75	0	0
8	45	1	55	120645	0	4	12	0	58	50	75	0	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0
9	45	1	56	120645	0	4	17	0	76	35	25	3	0	0	0	0	0	0	0	0	127	25	0	0	0	0	25	25	0
10	45	1	59	120645	0	4	19	0	59	10	25	0	0	0	0	0	0	0	25	0	127	0	25	25	0	0	0	0	0
11	45	1	61	120645	0	4	16	0	76	50	25	0	0	0	0	0	0	0	0	0	127	0	25	0	0	0	25	25	0
12	45	1	64	120645	0	4	8	0	37	30	25	3	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0
13	45	2	12	120645	0	4	0	0	75	62	75	0	0	0	0	0	0	0	0	0	0	0	0	75	75	75	75	0	0
14	45	2	37	120645	0	4	6	0	56	50	25	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0
15	45	2	40	120645	0	4	6	0	50	45	25	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0
16	45	2	41	120645	0	4	7	0	79	78	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
17	45	2	44	120645	0	4	3	0	78	35	25	0	0	0	0	0	0	0	0	0	25	0	0	0	25	0	0	25	0
18	45	2	53	120645	0	4	11	0	37	30	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0
19	45	2	63	120645	0	4	7	0	58	18	75	0	0	0	0	0	0	0	25	25	75	75	75	0	0	0	0	0	0
20	45	3	7	120645	0	4	1	0	78	76	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
21	45	3	32	120645	0	4	10	0	61	35	75	6	0	0	0	0	0	0	0	0	75	75	75	75	0	0	0	0	0
22	45	3	45	120645	0	4	4	0	50	40	25	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	25	0
23	45	3	46	120645	0	4	7	0	71	70	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0
24	45	3	50	120645	0	4	15	0	76	35	25	0	0	0	0	0	0	0	0	0	127	25	0	0	0	0	25	25	0
25	45	3	53	120645	0	4	18	0	48	25	75	0	0	0	0	0	0	0	0	75	127	75	75	0	0	0	0	0	0
26	45	3	58	120645	0	4	15	0	25	5	75	0	0	0	0	0	75	75	75	75	127	0	0	0	0	0	0	0	0
27	45	3	61	120645	0	4	6	0	35	15	75	0	0	0	0	0	0	0	75	75	75	0	0	0	0	0	0	0	0
28	45	4	15	120645	47	4	1	45	63	22	75	0	0	0	0	0	0	0	0	75	75	0	0	75	0	0	0	0	0
29	45	4	19	120645	0	4	4	25	81	14	88	1	0	1	0	0	0	0	75	75	75	75	75	75	75	0	0	50	0
30	45	4	42	120645	0	4	8	0	70	50	25	0	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	25	0
31	45	4	49	120645	0	4	18	0	77	45	75	0	0	0	0	0	0	0	0	0	127	25	25	0	0	0	75	75	0
32	45	4	53	120645	0	4	17	0	50	30	75	0	0	0	0	0	0	0	0	75	127	75	75	0	0	0	0	0	0
33	45	4	56	120645	0	4	10	5	46	13	100	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105	105
34	45	5	22	120645	0	4	7	0	77	40	75	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	75	75	0
35	45	5	35	120645	0	4	10	0	61	40	75	0	0	0	0	0	0	0	0	0	0	25	75	75	0	0	0	0	0
36	45	5	43	120645	0	4	4	0	79	76	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
37	45	5	45	120645	0	4	5	0	50	50	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
38	45	5	51	120645	0	4	13	0	56	35	75	0	0	0	0	0	0	0	0	0	75	75	75	0	0	0	0	0	0
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41	45	6	38	120645	0	4	5	0	56	35	75	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0	0
42	45	6	43	120645	0	4	3	0	76	45	25	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	25	25	0
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46	45	7	25	120645	0	4	9	0	56	35	75	0	0	0	0	0	0	0	0	0	75	75	75	0	0	0	0	0	0
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48	45	7	48	120645	0	4	14	0	60	50	75	0	0	0	0	0	0	0	0	0	0	25	75	75	0	0	0	0	0
49	45	7	50	120645	0	4	10	0	61	25	75	6	0	0	0	0	0	0	0	25	25	25	25	0	0	0	0	75	75
50	45	7	53	120645	0	4	7	5	56	20	100	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105
51	45	7	56	120645	0	4	5	0	58	29	100	1	0	0	0	0	0	0	0	75	100	100	100	105	105	105	105	105	105
52	45	7	57	120645	0	4	1	0	63	20	100	1	1	0	0	0	0	0	0	75	75	75	100	100	0	0	0	0	0
53	45	7	60	120645	32	4	1	0	65	28	100	0	0	0	0	0	0	0	0	25	25	75	75	100	100	105	105	105	105
54	45	8	37	120645	0	4	7	0	56	50	25	3	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0
55	45	8	43	120645	0	4	2	0	77	30	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	25	25	0
56	45	8	45	120645	0	4	4	0	72	70	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	0
57	45	8	47	120645	0	4	11	0	80	50	75	0	0	0	0	0	0	0	0	0	0	25	25	0	0	0	75	75	0
58	45	8	52	120645	0	4	7	0	62	50	100	1	1	0	0	0	0	0	0	25	25	75	100	100	105	105	105	105	105
59	45	8	53	120645	0	4	6	0	57	30	100	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105
60	45	8	55	120645	0	4	2	5	57	30	100	0	0	0	0	0	0	0	0	100	100	100	100	0	0	0	0	0	0
61	45	8	58	120645	0	4	1	0	65	45	100	1	2	0	0	0	0	0	0	0	75	75	100	100	105	105	105	105	105
62	45	8	61	120645	0	4	1	0	72	40	75	3	1	0	0	0	0	0	0	0	25	0	25	0	0	0	75	75	0
63	45	9	39	120645	0	4	5	0	61	40	25	0	0	0	0	0	0	0	0	0	25	25	0	25	0	0	0	0	0
64	45	9	41	120645	0	4	3	1	50	78	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0
65	45	9	43	120645	0	4	9	0	77	20	75	3	0	0	0	0	0	0	0	25	25	0	0	0	0	0	75	75	0
66	45	9	47	120645	0	4	12	0	57	22	75	1	0	0	0	0	0	0	0	25	25	75	75	0	0	0	0	0	0
67	45	9	50	120645	25	4	13	0	59	27	100	0	0	0	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
68	45	9	52	120645	0	4	7	0	65	45	100	0	0	0	0	0	0	0	0	0	0	75	100	100	100	105	105	105	105
69	45	9	55	120644	0	4	1	0	59	50	100	0	0	0	0	0	0	0	0	0	0	100	100	105	105	105	105	105	105
70	45	9	58	120645	0	4	1	0	66	25	75	3	1	0	0	0	0	0	0	25	0	0	75	75	75	0	0	0	0
71	45	9	61	120645	0	4	1	0	72	30	75	1	1	0	0	0	0	0	0	25	25	0	0	25	0	0	75	75	0
72	45	9	63	120645	0	4	1	0	59	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	45	10	22	120645	0	4	14	0	72	18	75	0	0	0	0	0	0	0	75	75	75	75	0	0	0	0	75	75	0
74	45	10	40	120645	0	4	5	0	69	35	25	0	0	0	0	0	0	0	0	0	25	0	0	0	0	25	0	0	0
75	45	10	45	120645	0	4	11	0	75	30	75	3	0	0	0	0	0	0	0	25	25	0	0	0	0	75	75	0	0
76	45	10	50	120644	0	4	15	0	56	20	100	0	0	0	0	0	0	0	0	100	127	100	100	105	105	105	105	105	105
77	45	10	51	120645	0	4	8	0	62	57	100	0	1	0	0	0	0	0	0	0	0	0	100	100	105	105	105	105	105
78	45	10	54	120645	0	4	1	0	65	48	100	1	0	0	0	0	0	0	0	0	100	100	100	100	100	105	105	105	105
79	45	10	55	120645	0	4	1	0	50	57	100	0	1	0	0	0	0	0	0	0	0	0	100	100	0	0	75	75	0
80	45	10	57	120645	0	4	0	0	72	57	100	0	0	0	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105
81	45	10	62	120645	0	4	1	0	77	75	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	0
82	45	11	37	120645	0	4	12	0	38	25	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0
83	45	11	48	120645	0	4	16	0	59	35	100	0	0	0	0	0	0	0	0	0	127	75	100	100	105	105	105	105	105
84	45	11	52	120645	0	4	3	0	63	58	100	0	0	0	0	0	0	0	0	0	0	0	100	100	105	105	105	105	105
85	45	11	53	120645	0	4	2	0	65	50	100	1	1	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105
86	45	11	55	120645	0	4	1	0	65	50	100	0	0	0	0	0	0	0	0	0	0	75	75	100	100	105	105	105	105
87	45	11	57	120645	0	4	1	0	50	22	50	0	0	0	0	0	0	0	0	50	0	0	0	50	0	0	0	50	0
88	45	11	59	120644	0	4	1	0	60	57	75	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	0	0	0
89	45	12	38	120645	0	4	5	0	65	40	25	0	0	0	0	0	0	0	0	0	25	25	0	0	25	0	0	0	0
90	45	12	39	120645	0	4	5	0	72	20	75	0	0	0	0	0	0	0	0	25	25	25	0	0	0	0	75	75	0
91	45	12	41	120645	0	4	18	0	57	40	75	0	0	0	0	0	0	0	0	0	127	75	75	0	0	0	0	0	0
92	45	12	53	120645	0	4	1	0	65	57	100	0	1	0	0	0	0	0	0	0	0	0	75	100	100	105	105	105	105
93	45	12	54	120645	0	4	1	0	70	57	100	0	1	0	0	0	0	0	0	0	0	0	75	0	0	100	100	100	0
94	45	12	56	120645	0	4	1	0	60	26	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
95	45	13	38	120645	0	4	6	0	50	10	75	0	0	0	0	0	0	0	25	75	75	75	0	0	0	0	0	0	0
96	45	13	41	120645	0	4	6	0	74	38	100	1	1	0	0	0	0	0	0	75	75	75	100	100	0	0	75	0	0
97	45	13	44	120645	0	4	6	0	72	35	100	0	0	0	0	0	0	0	0	0	25	0	75	75	0	100	100	100	105
98	45	13	46	120645	0	4	4	0	66	38	100	1	1	0	0	0	0	0	0	0	75	75	100	100	100	105	105	105	105
99	45	13	48	120645	0	4	7	0	68	50	100	0	0	0	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105
100	45	13	49	120645	0	4	5	0	72	55	100	0	0	0	0	0	0	0	0	0	0	0	75	100	100	100	100	105	105
101	45	13	50	120645	0	4	4	0	65	56	100	0	0	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105
102	45	13	51	120645	0	4	1	0	64	50	100	0	0	0	0	0	0	0	0	0	0	100	100	100	100	0	0	0	0
103	45	13	52	120642	0	4	1	0	50	22	50	0	0	0	0	0	0	0	0	50	0	0	0	50	0	0	0	50	0
104	45	13	53	120645	0	4	1	0	61	58	75	0	1	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0
105	45	14	19	120645	0	4	21	0	61	25	100	0	0	0	0	0	0	0	0	25	127	25	0	75	0	0	100	100	100
106	45	14	31	120645	0	4	11	0	67	56	100	1	1	0	0	0	0	0	0	0	0	0	65	95	95	95	105	105	105
107	45	14	39	120645	0	4	10	0	56	7	75	0	0	0	0	0	0	25	25	0	75	75	75	0	0	0	0	0	0
108	45	14	43	120644	0	4	12	0	59	27	100	0	0	0	0	0	0	0	0	75	75	100	100	100	105	105	105	105	105
109	45	14	50	120645	0	4	1	0	61	22	88	0	0	0	0	0	0	0	0	50	50	0	0	50	0	0	0	50	0
110	45	14	51	120645	0	4	1	0	61	22	88	0	0	0	0	0	0	0	0	50	50	0	0	50	0	0	0	50	0
111	45	15	7	120645	0	4	4	0	79	60	100	0	0	0	0	0	0	0	0	0	0	0	0	40	0	88	101	101	0
112	45	15	15	120645	0	4	17	0	61	35	75	0	0	0	0	0	0	0	0	0	127	25	75	75	0	0	0	0	0
113	45	15	35	120643	19	3	8	0	99	99	100	0	0	0	105	105	105	105	0	35	105	35	0	75	75	75	75	75	105
114	45	15	42	120645	0	4	15	0	68	30	100	0	0	0	0	0	0	0	0	75	127	75	100	100	100	0	0	0	0
115	45	15	43	120645	0	4	15	0	63	60	75	0	0	0	0	0	0	0	0	0	127	0	0	75	75	0	0	0	0
116	45	15	47	120645	0	4	5	0	63	40	75	1	1	0	0	0	0	0	0	0	25	25	0	75	0	0	0	0	0
117	45	15	48	120645	0	4	5	0	57	56	25	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0
118	45	15	49	120645	0	4	3	0	61	58	100	0	0	0	0	0	0	0	0	0	0	0	100	100	50	0	0	50	0
119	45	15	50	120644	0	4	1	0	64	58	100	0	0	0	0	0	0	0	0	0	0	0	100	100	100	0	0	0	0
120	45	15	51	120645	0	4	1	0	69	40	100	0	0	0	0	0	0	0	0	0	75	75	100	100	75	0	0	0	0

3DNeph Best Reports for Box 45

	Box	i	j	Julian Hour	Min	RPT TYP	Terrain El(MSL)	TW	MAX TOP	MIN BAS	TOT %	CLD TYP L	CLD TYP M	CLD TYP H	% COV (above Terrain) 1	2	3	4	5	6	% COV (above Mean Sea Level) 1	2	3	4	5	6	7	8	9
121	45	16	31	120645	0	4	11	0	80	35	100	0	0	0	0	0	0	0	0	0	25	25	0	75	100	100	100	100	105
122	45	16	35	120645	0	4	8	0	81	36	100	0	0	0	0	0	0	0	0	0	25	20	0	75	75	0	0	100	100
123	45	16	38	120645	0	4	11	0	63	30	100	0	0	0	0	0	0	0	0	75	75	75	100	100	100	0	0	0	0
124	45	16	45	120645	50	4	8	0	58	50	75	0	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0
125	45	16	50	120645	0	4	1	0	61	60	25	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
126	45	17	41	120645	0	4	29	0	61	14	75	3	1	0	0	0	0	0	70	75	127	75	75	0	5	0	0	0	0
127	45	17	43	120643	50	4	9	0	63	62	25	0	1	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
128	45	17	44	120645	0	4	6	0	78	60	25	0	1	0	0	0	0	0	0	0	0	0	0	25	0	0	28	28	0
129	45	17	45	120645	0	4	6	0	61	40	25	3	1	0	0	0	0	0	0	0	25	25	0	25	0	0	0	0	0
130	45	17	46	120645	0	4	5	0	61	35	75	1	1	0	0	0	0	0	0	0	25	0	75	75	0	0	0	0	0
131	45	17	49	120645	0	4	1	0	80	28	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
132	45	18	32	120645	0	4	7	0	24	18	25	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0
133	45	18	40	120642	0	4	16	0	80	78	50	0	0	1	0	0	0	0	0	0	127	0	0	0	0	0	0	50	0
134	45	18	44	120645	0	4	2	0	80	28	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
135	45	18	45	120645	0	4	1	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
136	45	18	46	120645	0	4	1	0	80	28	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
137	45	18	48	120645	0	4	1	0	77	40	25	3	1	0	0	0	0	0	0	0	25	0	0	25	0	0	25	25	0
138	45	18	49	120645	0	4	1	0	63	62	25	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
139	45	19	14	120645	0	4	20	0	61	6	75	0	0	0	0	0	0	25	25	75	127	75	75	75	0	0	0	0	0
140	45	19	21	120645	28	4	19	0	79	45	100	0	0	0	0	0	0	0	0	0	127	25	25	100	100	100	100	100	105
141	45	19	30	120643	48	3	1	0	99	99	100	0	0	2	105	105	105	105	105	105	105	105	105	105	105	105	0	100	105
142	45	19	42	120645	0	4	1	0	79	28	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
143	45	19	43	120645	0	4	1	0	79	28	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
144	45	19	44	120645	0	4	1	0	80	28	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
145	45	19	45	120645	0	4	1	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
146	45	19	46	120645	0	4	1	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
147	45	19	47	120645	0	4	1	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
148	45	19	48	120645	0	4	1	0	76	65	25	0	1	0	0	0	0	0	0	0	0	0	0	0	25	0	25	0	0
149	45	19	64	120642	0	4	0	2	80	41	75	2	1	1	0	0	0	0	0	0	20	20	0	30	0	0	0	30	0
150	45	20	19	120645	0	4	20	0	77	40	75	0	0	0	0	0	0	0	0	0	127	26	0	0	76	76	76	76	0
151	45	20	28	120645	0	4	2	0	75	50	75	0	0	0	0	0	0	0	0	0	0	25	0	76	0	0	76	0	0
152	45	20	29	120645	0	4	1	0	80	57	75	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	75	75	0
153	45	20	40	120645	0	4	4	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	45	20	42	120645	0	4	1	0	59	55	25	0	1	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0
155	45	20	46	120645	0	4	0	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
156	45	20	47	120645	0	4	1	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	45	20	48	120645	0	4	1	0	80	22	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
158	45	20	57	120642	0	4	0	3	80	28	28	1	0	0	0	0	0	0	0	25	25	25	0	5	0	0	0	5	0
159	45	21	27	120642	0	4	4	0	79	28	38	0	1	1	0	0	0	0	0	20	20	0	0	25	0	0	0	15	0
160	45	21	34	120645	0	4	9	0	81	65	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	100	100	0
161	45	21	39	120645	0	4	3	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	45	21	41	120642	0	4	1	5	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
163	45	21	42	120645	0	4	1	0	79	22	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
164	45	21	47	120645	0	4	1	0	81	28	88	0	0	0	0	0	0	0	0	80	50	0	0	50	0	0	0	50	0
165	45	21	48	120645	0	4	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	45	22	25	120645	0	4	4	0	52	50	75	0	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0
167	45	22	33	120645	0	4	8	0	80	60	75	0	1	0	0	0	0	0	0	0	0	0	0	25	0	0	75	75	0
168	45	22	34	120645	0	4	8	0	71	70	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	0	0
169	45	22	35	120645	0	4	7	0	77	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	76	0
170	45	22	40	120642	40	4	3	0	76	75	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	26	0
171	45	22	42	120642	0	4	0	5	79	62	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	5	0
172	45	22	50	120645	0	4	0	41	37	0	56	0	2	0	15	15	100	100	100	100	100	100	100	105	105	105	105	105	105
173	45	23	29	120644	15	3	1	0	99	99	105	0	2	2	105	105	105	105	105	35	35	0	0	35	35	0	0	10	105
174	45	23	40	120642	0	4	1	0	80	28	50	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	20	0
175	45	24	16	120645	0	4	14	41	78	28	100	0	0	0	0	0	0	0	0	25	25	25	25	100	100	100	100	100	105
176	45	24	30	120645	0	4	4	0	72	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	76	0
177	45	24	38	120642	0	4	2	0	80	78	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0
178	45	24	52	120642	0	4	0	0	81	70	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100
179	45	24	58	120642	0	4	0	25	64	14	100	3	0	0	0	0	0	0	100	100	100	100	100	100	100	105	105	105	105
180	45	25	35	120645	0	4	4	0	80	40	75	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	76	0
181	45	25	39	120642	0	4	0	0	80	57	13	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	15	0
182	45	26	20	120644	44	3	20	0	99	99	105	0	0	0	105	105	105	105	105	105	127	105	0	10	0	0	35	35	105
183	45	26	24	120645	0	4	1	0	74	73	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0
184	45	26	27	120645	0	4	5	0	78	18	75	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	76	76	0
185	45	26	32	120645	0	4	3	0	78	30	75	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	76	76	0
186	45	26	38	120645	0	4	4	0	80	30	75	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	76	0
187	45	26	38	120644	0	4	1	0	80	26	38	1	0	1	0	0	0	0	0	15	0	0	0	0	0	0	0	30	0
188	45	26	39	120642	0	4	1	0	79	79	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
189	45	26	58	120642	0	4	0	2	25	5	100	4	2	0	0	0	100	100	100	100	105	105	105	105	105	105	105	105	105
190	45	27	10	120645	0	4	2	45	68	8	100	0	0	0	0	100	100	100	100	100	0	0	75	75	0	0	0	0	0
191	45	27	27	120642	0	4	1	0	79	78	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
192	45	27	40	120642	0	4	1	0	77	30	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	25	25	0
193	45	28	34	120645	0	4	8	0	78	40	25	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	26	0	0
194	45	28	37	120645	0	4	5	0	78	55	75	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	76	76	0
195	45	28	40	120645	0	4	1	0	76	15	25	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	26	0	0
196	45	28	41	120642	0	4	1	0	81	79	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	90
197	45	29	13	120645	38	4	4	0	71	59	100	0	0	0	0	0	0	0	0	0	0	0	100	100	100	100	105	105	105
198	45	29	23	120645	0	4	1	0	78	60	25	3	0	0	0	0	0	0	0	25	0	0	0	0	0	28	0	0	0
199	45	29	33	120645	0	4	1	0	76	35	25	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	28	0	0
200	45	30	33	120645	0	4	1	0	36	30	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0
201	45	30	35	120643	0	4	4	0	47	40	25	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0
202	45	30	36	120642	0	4	3	0	60	15	25	0	0	0	0	0	0	0	25	25	25	25	0	0	0	0	0	26	0
203	45	30	39	120642	0	4	2	0	80	79	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
204	45	31	29	120645	0	4	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
205	45	31	30	120642	0	4	0	0	68	66	25	3	1	0	0	0	0	0	0	15	0	0	0	15	0	0	0	0	0
206	45	31	37	120645	0	4	1	0	35	14	75	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0	0	0	0
207	45	32	21	120644	0	4	1	0	87	61	25	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0
208	45	32	30	120642	0	4	0	2	79	78	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
209	45	32	32	120642	0	4	1	2	80	78	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
210	45	33	18	120645	0	4	1	0	75	30	75	0	0	0	0	0	0	0	0	46	0	0	0	0	0	0	76	0	0
211	45	34	28	120642	0	4	1	2	76	57	50	2	0	2	0	0	0	0	0	0	0	0	50	0	0	0	0	5	0
212	45	34	34	120645	0	4	1	0	80	60	25	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
213	45	35	18	120645	0	4	1	0	76	60	25	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	26	0	0
214	45	35	20	120644	0	4	0	0	66	25	25	0	0	0	0	0	0	0	0	25	0	0	0	0	25	0	0	0	0
215	45	35	22	120645	0	4	1	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
216	45	35	30	120643	0	4	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
217	45	35	31	120645	0	4	1	0	26	20	25	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0
218	45	35	40	120642	0	4	0	0	37	2	100	2	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105	105	105
219	45	36	13	120645	0	4	4	0	56	25	100	0	0	0	0	0	0	0	0	100	100	100	0	0	0	0	0	0	0
220	45	36	25	120645	0	4	7	0	47	40	25	0	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0
221	45	36	32	120642	0	4	1	0	81	76	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100
222	45	36	43	120642	0	4	0	0	37	2	100	2	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105	105	105
223	45	37	17	120645	0	4	1	0	38	18	75	0	0	0	0	0	0	0	75	75	75	0	0	0	0	0	0	0	0
224	45	37	23	120645	0	4	2	0	80	25	25	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	25	0
225	45	37	37	120645	0	4	0	0	46	15	100	0	0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
226	45	37	39	120642	0	4	0	1	80	5	38	6	1	5	0	0	0	20	20	25	0	0	0	10	0	0	0	10	0
227	45	38	38	120644	0	4	7	0	26	20	25	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0
228	45	38	38	120642	0	4	0	0	45	14	100	2	0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
229	45	38	37	120643	0	4	0	0	67	59	100	6	3	0	0	0	0	0	0	100	100	100	0	90	90	105	105	105	105
230	45	39	22	120645	0	4	6	0	57	15	100	0	0	0	0	0	0	0	75	75	100	100	100	105	105	105	105	105	105
231	45	40	21	120645	0	4	1	0	49	17	100	0	0	0	0	0	0	0	100	100	100	100	105	105	105	105	105	105	105
232	45	40	25	120644	0	4	6	0	50	26	75	0	0	0	0	0	0	0	0	75	75	75	0	0	0	0	0	0	0
233	45	40	35	120645	0	4	0	0	45	14	100	1	0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
234	45	41	21	120645	0	4	2	0	59	14	100	0	0	0	0	0	0	0	75	100	100	100	100	105	105	105	105	105	105
235	45	41	37	120645	0	4	1	0	58	28	38	1	0	0	0	0	0	0	0	40	40	0	0	0	0	0	0	0	0
236	45	41	38	120642	0	4	0	1	80	75	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0
237	45	41	30	120642	0	4	0	0	81	78	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	0
238	45	41	32	120642	0	4	0	2	45	14	100	6	0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
239	45	42	23	120642	0	4	5	0	62	22	75	1	1	0	0	0	0	0	0	75	75	0	0	5	0	0	0	0	0
240	45	42	27	120644	0	4	1	0	31	25	25	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0

3DNeph Best Reports for Box 48

Box	i	j	Julian Hour	Min	RPT TYP	Terrain El(MSL)	PW	MAX TOP	MIN BAS	TOT %	CLD TYP L M H	% COV (above Terrain) 1	2	3	4	5	6	% COV (above Mean Sea Level) 1	2	3	4	5	6	7	8	9
241	45	42	40	120042	0	4	0	0	81	14	63	3 1 1	0	0	0	0	35	40	40	40	40	45	45	45	45	25	44
242	45	44	21	120044	0	4	1	0	59	3	100	0 0 0	0	0	75	75	75	100	100	100	100	105	105	105	105	105	105
243	45	44	25	120045	0	4	2	0	56	20	100	1 0 0	0	0	0	0	0	100	100	100	0	0	0	0	0	0	0
244	45	44	28	120042	0	4	0	2	37	8	100	1 0 0	0	0	0	100	100	100	100	105	105	105	105	105	105	105	105
245	45	44	31	120042	0	4	0	0	81	79	88	0 0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	90
246	45	45	23	120045	31	4	2	45	34	0	100	0 0 0	100	100	100	100	100	100	100	105	105	105	105	105	105	105	105
247	45	48	58	120042	0	4	0	2	81	14	75	3 1 3	0	0	0	0	5	15	15	15	15	50	50	50	50	45	45
248	45	49	31	120042	0	4	0	0	58	41	100	1 0 0	0	0	0	0	0	0	100	100	100	0	105	105	105	105	105
249	45	50	27	120042	0	4	0	0	58	28	100	1 0 0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105
250	45	52	20	120045	0	4	0	47	50	0	100	0 0 0	100	100	0	0	0	100	100	100	105	105	105	105	105	105	105
251	45	52	21	120045	0	4	0	44	64	0	100	0 0 0	50	50	0	0	0	100	100	100	0	50	105	105	105	105	105
252	45	52	22	120045	0	4	0	47	59	0	100	0 0 0	100	100	0	0	0	100	100	100	100	105	105	105	105	105	105
253	45	52	26	120042	0	4	0	15	81	14	88	1 0 0	0	0	0	0	85	85	85	85	85	5	5	0	0	5	0
254	45	52	45	120042	0	4	0	0	81	26	88	4 1 1	0	0	0	0	0	75	75	75	75	70	70	70	70	65	65
255	45	53	44	120042	0	4	0	0	6	5	105	0 0 0	105	105	5	5	105	105	105	105	105	105	105	105	105	105	105
256	45	54	30	120042	0	4	0	0	45	14	100	1 0 0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
257	45	55	15	120042	0	4	0	0	68	28	75	1 1 0	0	0	0	0	0	75	75	0	0	5	0	0	0	0	0
258	45	55	22	120042	0	4	0	2	48	41	85	3 0 0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0
259	45	55	31	120042	0	4	0	2	56	26	100	1 0 0	0	0	0	0	0	100	100	100	105	105	105	105	105	105	105
260	45	55	32	120042	0	4	0	0	45	14	100	2 0 0	0	0	0	0	100	100	100	105	105	105	105	105	105	105	105
261	45	56	15	120042	0	4	0	2	68	88	75	0 1 0	105	105	105	105	105	75	75	105	105	75	75	105	105	105	105
262	45	57	12	120042	0	4	0	25	64	2	100	1 0 0	0	0	0	100	100	100	100	100	100	100	100	105	105	105	105
263	45	57	20	120042	0	4	0	0	50	14	100	1 0 0	0	0	0	0	100	100	100	100	0	0	105	105	105	105	105
264	45	58	14	120042	0	4	0	3	63	14	75	1 1 0	0	0	0	0	60	65	65	0	0	35	0	0	0	0	0
265	45	58	38	120042	0	4	0	3	30	2	100	1 0 0	0	100	100	100	100	100	105	105	105	105	105	105	105	105	105
266	45	59	52	120042	0	4	0	15	81	8	75	4 1 1	0	0	0	35	40	40	40	40	40	55	55	55	55	50	50
267	45	60	31	120042	0	4	0	50	59	5	100	2 1 0	0	0	100	100	100	100	100	100	100	105	105	105	105	105	105
268	45	61	25	120042	0	4	0	25	77	14	100	1 3 0	0	0	0	0	75	75	75	75	75	95	95	95	95	95	105
269	45	62	12	120042	0	4	0	3	76	41	63	3 1 0	0	0	0	0	0	0	40	40	40	60	60	60	60	0	0
270	45	63	7	120042	0	4	0	0	81	26	88	3 0 0	0	0	0	0	0	85	85	85	85	70	70	70	0	5	0
271	45	64	26	120042	0	4	0	3	81	79	100	0 0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100

RTNeph Best Reports for Box 45

	Box	i	j	JulTime	DS	TC	PW	Vis	Layer 1				Layer 2				Layer 3				Layer 4			
									Amt	Typ	Bas	Top	Amt	Typ	Bas	Top	Amt	Typ	Bas	Top	Amt	Typ	Bas	Top
1	45	1	34	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	45	1	41	893680	4	12	70	70	5	25	22	255	5	25	124	255	5	25	209	255	0	0	0	0
3	45	1	42	893680	4	87	0	64	50	25	31	255	50	25	127	255	50	25	209	255	0	0	0	0
4	45	1	45	893680	4	25	0	74	10	25	29	255	10	25	125	255	10	25	209	255	0	0	0	0
5	45	1	48	893680	4	87	0	61	50	25	33	255	50	25	129	255	50	25	210	255	0	0	0	0
6	45	1	50	893680	4	25	0	66	10	25	34	255	10	25	130	255	10	25	210	255	0	0	0	0
7	45	1	52	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	45	1	54	893680	4	25	0	80	10	25	32	255	10	25	128	255	10	25	210	255	0	0	0	0
9	45	1	55	893680	4	25	0	74	10	25	34	255	10	25	130	255	10	25	211	255	0	0	0	0
10	45	1	56	893680	4	25	0	61	10	25	39	255	10	25	135	255	10	25	211	255	0	0	0	0
11	45	1	61	893680	4	100	0	74	100	25	106	255	0	0	0	0	0	0	0	0	0	0	0	0
12	45	1	64	893680	4	100	0	74	100	25	108	255	0	0	0	0	0	0	0	0	0	0	0	0
13	45	2	37	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	45	2	40	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	45	2	44	893680	4	12	2	74	10	7	121	255	0	0	0	0	0	0	0	0	0	0	0	0
16	45	2	48	893680	4	87	0	74	50	25	38	255	50	25	132	255	50	25	210	255	0	0	0	0
17	45	2	53	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	45	2	63	893680	4	87	0	74	50	25	29	255	50	25	125	255	50	25	210	255	0	0	0	0
19	45	3	7	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	45	3	32	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	45	3	45	893680	4	25	0	80	10	25	26	255	10	25	122	255	10	25	209	255	0	0	0	0
22	45	3	46	893680	4	87	25	80	50	25	23	255	50	25	125	255	50	25	209	255	0	0	0	0
23	45	3	50	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	45	3	53	893680	4	25	0	74	10	25	40	255	10	25	136	255	10	25	211	255	0	0	0	0
25	45	3	56	893680	4	87	0	80	50	25	37	255	50	25	133	255	50	25	211	255	0	0	0	0
26	45	3	61	893680	4	25	0	83	10	25	28	255	10	25	124	255	10	25	210	255	0	0	0	0
27	45	4	15	893680	4	100	76	48	100	3	15	255	0	0	0	0	0	0	0	0	0	0	0	0
28	45	4	19	893680	4	100	76	48	100	3	18	255	0	0	0	0	0	0	0	0	0	0	0	0
29	45	4	49	893680	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	45	4	53	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	45	4	58	893680	4	87	0	80	50	25	32	255	50	25	128	255	50	25	210	255	0	0	0	0
32	45	5	28	893680	4	62	1	66	60	3	33	255	0	0	0	0	0	0	0	0	0	0	0	0
33	45	5	33	893680	4	25	2	74	25	3	32	255	0	0	0	0	0	0	0	0	0	0	0	0
34	45	5	45	893680	4	100	71	66	100	25	39	255	0	0	0	0	0	0	0	0	0	0	0	0
35	45	5	47	893680	4	0	2	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	45	5	51	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	45	5	55	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	45	6	38	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	45	6	43	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	45	6	54	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	45	6	56	893680	4	87	0	80	50	25	24	255	50	25	120	255	50	25	210	255	0	0	0	0
42	45	7	42	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	45	7	46	893680	4	25	0	74	10	25	36	255	10	25	132	255	10	25	210	255	0	0	0	0
44	45	7	50	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	45	7	53	893680	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	45	7	56	893680	4	25	0	74	10	25	27	255	10	25	123	255	10	25	210	255	0	0	0	0
47	45	7	57	893680	4	87	0	69	50	25	23	255	50	25	119	255	50	25	210	255	0	0	0	0
48	45	7	60	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	45	8	37	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	45	8	43	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	45	8	45	893680	4	87	25	48	50	25	20	255	50	25	122	255	50	25	209	255	0	0	0	0
52	45	8	47	893680	4	87	0	66	50	25	33	255	50	25	129	255	50	25	210	255	0	0	0	0
53	45	8	52	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	45	8	53	893680	4	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	45	8	55	893680	4	25	0	80	10	25	24	255	10	25	120	255	10	25	210	255	0	0	0	0
56	45	8	58	893680	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	45	8	61	893680	4	25	0	61	10	25	22	255	10	25	119	255	10	25	210	255	0	0	0	0
58	45	9	39	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	45	9	41	893674	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	45	9	47	893680	4	25	0	74	10	25	34	255	10	25	130	255	10	25	210	255	0	0	0	0
61	45	9	50	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	45	9	52	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	45	9	55	893680	4	25	0	61	10	25	22	255	10	25	119	255	10	25	209	255	0	0	0	0
64	45	9	57	893680	4	50	0	64	20	25	22	255	20	25	119	255	20	25	209	255	0	0	0	0
65	45	9	58	893680	4	25	0	61	10	25	22	255	10	25	119	255	10	25	209	255	0	0	0	0
66	45	9	60	893680	4	50	0	61	20	25	22	255	20	25	119	255	20	25	210	255	0	0	0	0
67	45	9	61	893680	4	25	0	69	10	25	22	255	10	25	119	255	10	25	210	255	0	0	0	0
68	45	10	28	893680	4	100	71	32	100	3	36	255	0	0	0	0	0	0	0	0	0	0	0	0
69	45	10	35	893680	4	87	0	64	50	25	32	255	50	25	128	255	50	25	209	255	0	0	0	0
70	45	10	40	893680	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	45	10	45	893680	4	25	0	80	10	25	33	255	10	25	129	255	10	25	210	255	0	0	0	0
72	45	10	51	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	45	10	54	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	45	10	55	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	45	10	57	893680	4	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	45	10	60	893680	4	12	0	62	5	25	22	255	5	25	119	255	5	25	210	255	0	0	0	0
77	45	10	62	893680	4	25	0	61	10	25	22	255	10	25	119	255	10	25	210	255	0	0	0	0
78	45	11	37	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	45	11	48	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	45	11	52	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	45	11	53	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	45	11	55	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	45	11	57	893680	4	12	0	64	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
84	45	11	59	893680	4	50	0	64	20	25	22	255	20	25	119	255	20	25	210	255	0	0	0	0
85	45	11	64	893680	4	12	0	59	5	25	22	255	5	25	119	255	5	25	210	255	0	0	0	0
86	45	12	36	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	45	12	39	893680	4	0	36	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	45	12	41	893680	4	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	45	12	51	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	45	12	53	893680	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	45	12	54	893680	4	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	45	13	38	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	45	13	41	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	45	13	44	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	45	13	46	893680	4	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	45	13	48	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	45	13	49	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	45	13	50	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	45	13	51	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	45	13	53	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	45	14	19	893680	4	100	71	59	100	3	34	255	0	0	0	0	0	0	0	0	0	0	0	0
102	45	14	31	893680	4	100	71	58	100	7	66	255	0	0	0	0	0	0	0	0	0	0	0	0
103	45	14	39	893680	4	5	0	0	5	25	51	255	0	0	0	0	0	0	0	0	0	0	0	0
104	45	14	49	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	45	14	51	893680	4	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	45	15	7	893680	4	100	71	16	100	25	26	255	0	0	0	0	0	0	0	0	0	0	0	0
107	45	15	42	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	45	15	43	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	45	15	47	893680	4	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	45	15	48	893680	4	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	45	15	49	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	45	15	50	893680	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	45	15	51	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	45	16	31	893680	4	100	71	22	100	3	60	255	0	0	0	0	0	0	0	0	0	0	0	0
115	45	16	35	893680	4	25	0	74	10	25	30	255	10	25	126	255	10	25	209	255	0	0	0	0
116	45	16	36	893680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	45	16	50	893680	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	45	17	32	893680	4	87	0	59	50	25	38	255	50	25	134	255	50	25	210	255	0	0	0	0
119	45	17	41	893680	4	100	49	0	100	25	51	255	0	0	0	0	0	0	0	0	0	0	0	0
120	45	17	43	893680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RTNeph Best Reports for Box 45

	Box	i	j	JulTime	DS	TC	PW	Vis	Layer 1				Layer 2				Layer 3				Layer 4			
									Amt	Typ	Bas	Top	Amt	Typ	Bas	Top	Amt	Typ	Bas	Top	Amt	Typ	Bas	Top
121	45	17	44	895686	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	17	45	895686	4	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	45	17	46	895686	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	45	17	49	895686	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	45	17	51	895680	4	12	1	70	10	4	22	255	0	0	0	0	0	0	0	0	0	0	0	0
126	45	18	32	895680	4	87	0	64	50	25	29	255	50	25	128	255	50	25	209	255	0	0	0	0
127	45	18	40	895680	4	0	2	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	45	18	44	895686	4	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	45	18	45	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	45	18	46	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	45	18	48	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	45	18	49	895680	4	12	0	68	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
133	45	19	14	895680	4	100	71	59	100	3	30	255	0	0	0	0	0	0	0	0	0	0	0	0
134	45	19	21	895681	4	100	71	48	100	25	44	255	0	0	0	0	0	0	0	0	0	0	0	0
135	45	19	42	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	45	19	43	895674	4	12	0	68	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
137	45	19	44	895674	4	12	0	68	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
138	45	19	46	895680	4	12	0	0	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
139	45	19	47	895680	4	12	0	64	5	25	23	255	5	25	119	255	5	25	209	255	0	0	0	0
140	45	19	48	895686	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	45	20	19	895680	4	100	71	62	100	2	34	255	0	0	0	0	0	0	0	0	0	0	0	0
142	45	20	28	895680	4	100	71	74	20	3	22	255	100	25	208	255	0	0	0	0	0	0	0	0
143	45	20	29	895682	4	100	25	16	100	25	18	255	0	0	0	0	0	0	0	0	0	0	0	0
144	45	20	40	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	45	20	42	895686	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	45	20	46	895680	4	87	0	66	50	25	22	255	50	25	118	255	50	25	209	255	0	0	0	0
147	45	20	47	895686	4	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	45	20	48	895680	4	12	0	62	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
149	45	21	34	895686	4	87	0	66	50	25	31	255	50	25	127	255	50	25	209	255	0	0	0	0
150	45	21	39	895686	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	45	21	41	895680	4	12	0	68	5	25	23	255	5	25	119	255	5	25	209	255	0	0	0	0
152	45	21	42	895674	4	50	0	68	20	25	22	255	20	25	119	255	20	25	209	255	0	0	0	0
153	45	21	47	895680	4	12	0	66	5	25	22	255	5	25	119	255	5	25	209	255	0	0	0	0
154	45	21	48	895686	4	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	45	22	25	895680	4	87	2	80	25	7	79	255	0	0	0	0	0	0	0	0	0	0	0	0
156	45	22	33	895686	4	25	0	64	10	25	30	255	10	25	128	255	10	25	209	255	0	0	0	0
157	45	22	35	895680	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158	45	22	40	895686	4	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	45	23	40	895680	4	50	0	68	20	25	22	255	20	25	119	255	20	25	209	255	0	0	0	0
160	45	23	58	895680	4	87	29	80	70	25	16	255	35	25	118	255	35	25	210	255	0	0	0	0
161	45	24	16	895680	4	100	71	66	100	3	30	255	0	0	0	0	0	0	0	0	0	0	0	0
162	45	24	30	895680	4	37	36	69	35	3	30	255	0	0	0	0	0	0	0	0	0	0	0	0
163	45	24	38	895680	4	87	0	68	50	25	24	255	50	25	120	255	50	25	209	255	0	0	0	0
164	45	25	8	895680	4	100	71	48	100	3	58	255	0	0	0	0	0	0	0	0	0	0	0	0
165	45	25	35	895680	4	50	2	74	15	3	45	255	45	10	209	255	0	0	0	0	0	0	0	0
166	45	26	25	895680	4	100	0	40	100	25	1	255	0	0	0	0	0	0	0	0	0	0	0	0
167	45	26	27	895680	4	0	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	45	26	32	895680	4	62	2	74	20	3	29	255	50	10	208	255	0	0	0	0	0	0	0	0
169	45	26	36	895680	4	25	2	74	25	3	30	255	0	0	0	0	0	0	0	0	0	0	0	0
170	45	27	40	895680	4	87	0	66	50	25	23	255	50	25	119	255	50	25	209	255	0	0	0	0
171	45	27	43	895680	4	100	2	40	60	25	22	255	60	25	116	255	60	25	209	255	0	0	0	0
172	45	28	34	895680	4	5	0	0	5	25	7	255	0	0	0	0	0	0	0	0	0	0	0	0
173	45	28	37	895680	4	100	37	66	100	3	69	255	0	0	0	0	0	0	0	0	0	0	0	0
174	45	28	40	895680	4	87	25	74	25	3	27	255	0	0	0	0	0	0	0	0	0	0	0	0
175	45	29	15	895680	4	100	71	48	100	3	24	255	0	0	0	0	0	0	0	0	0	0	0	0
176	45	29	23	895680	4	100	71	59	100	3	20	255	0	0	0	0	0	0	0	0	0	0	0	0
177	45	29	33	895680	4	0	36	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	45	29	36	895680	4	100	71	40	20	25	17	255	20	25	119	255	20	25	209	255	0	0	0	0
179	45	30	33	895680	4	37	2	66	35	3	42	255	0	0	0	0	0	0	0	0	0	0	0	0
180	45	30	36	895680	4	100	71	16	100	25	11	255	0	0	0	0	0	0	0	0	0	0	0	0
181	45	31	29	895683	4	100	25	32	100	25	26	255	0	0	0	0	0	0	0	0	0	0	0	0
182	45	31	30	895680	4	100	25	2	100	25	22	255	0	0	0	0	0	0	0	0	0	0	0	0
183	45	31	37	895680	4	100	25	69	100	3	26	255	0	0	0	0	0	0	0	0	0	0	0	0
184	45	31	38	895680	4	100	2	70	20	25	22	255	20	25	118	255	20	25	209	255	0	0	0	0
185	45	32	21	895670	4	5	0	0	5	25	15	255	0	0	0	0	0	0	0	0	0	0	0	0
186	45	33	12	895680	4	100	71	32	100	3	21	255	0	0	0	0	0	0	0	0	0	0	0	0
187	45	33	42	895680	4	100	71	40	100	3	14	255	0	0	0	0	0	0	0	0	0	0	0	0
188	45	34	34	895680	4	100	71	24	100	3	16	255	0	0	0	0	0	0	0	0	0	0	0	0
189	45	34	35	895680	4	75	2	60	35	25	22	255	35	25	118	255	35	25	206	255	0	0	0	0
190	45	34	37	895680	4	100	26	20	20	25	16	255	20	25	118	255	20	25	209	255	0	0	0	0
191	45	35	17	895680	4	100	0	66	100	3	29	255	0	0	0	0	0	0	0	0	0	0	0	0
192	45	35	20	895680	4	100	25	56	100	3	16	255	0	0	0	0	0	0	0	0	0	0	0	0
193	45	35	28	895680	4	100	25	6	100	25	6	255	0	0	0	0	0	0	0	0	0	0	0	0
194	45	35	31	895681	4	100	25	48	100	25	25	255	0	0	0	0	0	0	0	0	0	0	0	0
195	45	36	15	895680	4	100	2	74	100	3	18	255	0	0	0	0	0	0	0	0	0	0	0	0
196	45	36	25	895680	4	100	26	61	100	3	35	255	0	0	0	0	0	0	0	0	0	0	0	0
197	45	37	17	895680	4	100	2	74	100	3	27	255	0	0	0	0	0	0	0	0	0	0	0	0
198	45	37	23	895680	4	75	26	74	75	3	34	255	0	0	0	0	0	0	0	0	0	0	0	0
199	45	37	37	895680	4	100	25	16	100	3	15	255	0	0	0	0	0	0	0	0	0	0	0	0
200	45	38	28	895680	4	100	71	48	100	3	27	255	0	0	0	0	0	0	0	0	0	0	0	0
201	45	38	35	895680	4	100	72	60	100	25	22	255	0	0	0	0	0	0	0	0	0	0	0	0
202	45	38	36	895680	4	100	71	20	100	25	22	255	0	0	0	0	0	0	0	0	0	0	0	0
203	45	39	20	895680	4	100	2	22	100	3	61	255	0	0	0	0	0	0	0	0	0	0	0	0
204	45	40	21	895680	4	75	2	74	15	3	31	255	65	7	101	255	0	0	0	0	0	0	0	0
205	45	40	34	895680	4	100	71	60	100	3	26	255	0	0	0	0	0	0	0	0	0	0	0	0
206	45	40	53	895680	4	62	2	70	60	3	26	255	0	0	0	0	0	0	0	0	0	0	0	0
207	45	41	21	895680	4	87	0	20	50	25	24	255	50	25	120	255	50	25	208	255	0	0	0	0
208	45	42	27	895680	4	87	25	56	25	4	15	255	0	0	0	0	0	0	0	0	0	0	0	0
209	45	44	21	895680	4	87	2	20	25	3	42	255	0	0	0	0	0	0	0	0	0	0	0	0
210	45	44	25	895680	4	87	26	66	25	3	22	255	0	0	0	0	0	0	0	0	0	0	0	0
211	45	45	23	895680	4	100	0	62	20	25	24	255	20	25	120	255	20	25	208	255	0	0	0	0
212	45	53	20	895680	4	75	2	60	75	3	26	255	0	0	0	0	0	0	0	0	0	0	0	0
213	45	53	21	895680	4	25	26	70	25	3	16	255	0	0	0	0	0	0	0	0	0	0	0	0
214	45	53	22	895680	4	75	1	70	75	7	75	255	0	0	0	0	0	0	0	0	0	0	0	0
215	45	53	49	895680	4	100	3	60	100	25	26	255	0	0	0	0	0	0	0	0	0	0	0	0
216	45	54	20	895680	4	100	22	60	100	3	14	255	0	0	0	0	0	0	0	0	0	0	0	0
217	45	54	32	895680	4	100	20	70	100	2	22	255	0	0	0	0	0	0	0	0	0	0	0	0
218	45	61	29	895680	4	100	30	60	100	25	22	255	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B – The Nephanalysis Output

The following pages contain a portion of the conventional-report nephanalysis data for Box 45 for each of the case-study days, along with listings of the layer source bytes and status/diagnostic word for the RTNeph output for 85010. In these listings, the *RTNeph Embedded SpreadTo Points* are the points shown in Figure (2c). The mnemonics for the 'layer source' bytes correspond to the following conditions:

LoP	Low cloud was persisted
BEs	Cloud base was estimated
TEs	Cloud top was estimated
BRR	Best report from RAOB (radiosonde) was used
BRP	Best report from PIREP (aircraft pilot report) was used
BRS	Best report from surface-observer data was used
VSa	Visual satellite data was used
ISa	Infrared satellite data was used

For more information, consult the AFGWC *Data Format Handbook*[4].

3DNeph Analysis for Box 45

	TLC	TMC	THC	PW	MAX TOP	MIN BAS	TOT %	% Cov (Layers above Terrain) 1	2	3	4	5	6	% Cov (Layers above Mean Sea Level) 7	8	9	10	11	12	13	14	15
1	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	2	2	0	0	62	1	100	35	35	35	35	35	35	35	5	10	100	0	0	0	0	0
4	2	2	0	0	63	4	100	65	65	65	65	65	100	100	100	100	100	0	0	0	0	0
5	2	1	0	0	62	7	100	100	100	100	100	100	100	80	100	100	100	0	0	0	0	0
6	2	1	0	0	68	9	100	15	15	15	15	15	15	18	100	10	10	0	0	0	0	0
7	2	1	0	0	63	11	100	5	5	5	5	5	5	10	5	100	10	0	0	0	0	0
8	2	3	0	0	71	24	100	0	0	0	0	10	100	100	100	100	100	100	100	0	0	0
9	1	3	1	0	76	50	100	0	0	0	0	0	0	127	95	100	100	0	100	100	0	0
10	3	3	1	0	75	33	100	0	0	0	0	0	20	20	65	100	100	0	85	85	0	0
11	0	3	1	0	75	57	100	0	0	0	0	0	0	0	0	100	100	0	60	35	0	0
12	0	3	1	0	78	57	100	0	0	0	0	0	0	0	0	100	100	0	0	35	60	0
13	0	3	1	0	73	57	100	0	0	0	0	0	0	0	0	100	100	85	0	60	0	0
14	1	2	0	0	70	50	100	0	0	0	0	0	0	0	100	50	0	0	35	0	0	0
15	1	1	1	0	73	35	100	0	0	0	0	0	0	5	100	100	0	0	75	75	0	0
16	0	2	0	0	70	57	83	0	0	0	0	0	0	0	0	10	0	0	80	0	0	0
17	0	1	0	0	66	64	52	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
18	0	1	0	0	67	57	100	0	0	0	0	0	0	0	0	65	0	95	0	0	0	0
19	1	2	0	0	70	50	100	0	0	0	0	0	0	0	95	95	65	0	65	0	0	0
20	0	2	0	0	62	57	85	0	0	0	0	0	0	0	0	85	85	0	0	0	0	0
21	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	2	0	0	0	56	6	100	0	0	0	100	100	100	100	100	0	0	0	0	0	0	0
36	2	0	0	0	58	10	100	0	0	0	0	100	100	100	100	0	0	0	0	0	0	0
37	2	2	0	0	60	10	33	0	0	0	0	15	15	15	35	35	0	0	0	0	0	0
38	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2	[illegible]	0	0	56	0	50	50	50	50	50	50	50	35	35	0	0	0	0	0	0	0
44	2	0	0	0	56	10	34	0	0	0	0	35	35	10	10	0	0	0	0	0	0	0
45	1	2	0	0	58	35	63	0	0	0	0	0	0	65	50	50	0	0	0	0	0	0
46	2	2	0	0	58	10	44	0	0	0	0	5	0	45	45	30	0	0	0	0	0	0
47	2	1	0	0	66	10	81	0	0	0	0	35	80	55	55	30	0	10	0	0	0	0
48	2	1	0	0	67	10	95	0	0	0	0	85	95	95	95	95	45	85	0	0	0	0
49	3	0	0	0	57	20	45	0	0	0	0	0	45	45	45	0	0	0	0	0	0	0
50	3	2	0	0	58	20	28	0	0	0	0	0	30	30	30	5	0	0	0	0	0	0
51	2	2	0	0	58	6	25	0	0	0	10	85	85	80	20	5	0	0	0	0	0	0
52	2	2	0	0	58	6	58	0	0	0	5	5	85	85	60	60	0	0	0	0	0	0
53	2	2	0	0	60	10	48	0	0	0	0	25	85	85	50	50	0	0	0	0	0	0
54	1	0	0	0	50	20	6	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0
55	0	0	0	0	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	2	2	0	0	58	0	39	20	20	20	20	20	20	20	40	40	0	0	0	0	0	0
57	2	1	0	0	58	0	91	80	80	80	90	80	85	5	10	90	0	0	0	0	0	0

RTNeph Analysis for Box 45

	FW	Vis	Tf	TC	Layer 1 Amt	Typ	Bas	Top	Layer 2 Amt	Typ	Bas	Top	Layer 3 Amt	Typ	Bas	Top	Layer 4 Amt	Typ	Bas	Top
1	0	0	8	100	100	4	34	101	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	8	100	100	4	20	130	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	8	100	25	7	84	151	100	4	37	104	0	0	0	0	0	0	0	0
4	0	0	8	100	40	7	112	179	100	4	35	123	0	0	0	0	0	0	0	0
5	0	0	10	100	100	3	25	85	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	10	100	100	3	44	104	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	10	100	100	3	25	85	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	10	100	100	3	35	95	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	10	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	10	100	100	4	31	119	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	10	86	20	7	80	147	85	3	50	110	0	0	0	0	0	0	0	0
12	0	0	10	42	15	5	104	137	35	4	13	110	0	0	0	0	0	0	0	0
13	0	0	10	100	85	7	98	185	100	4	61	198	0	0	0	0	0	0	0	0
14	0	0	10	100	90	7	70	175	100	4	52	119	0	0	0	0	0	0	0	0
15	0	0	10	100	80	7	114	183	100	4	31	119	0	0	0	0	0	0	0	0
16	0	0	10	100	60	7	88	155	100	3	27	87	0	0	0	0	0	0	0	0
17	0	0	10	100	100	4	2	120	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	10	100	100	4	6	128	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	10	100	100	4	4	130	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	10	100	100	3	0	68	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	10	100	100	3	0	58	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	10	100	100	3	12	72	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	10	100	100	3	12	72	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	10	25	25	3	8	68	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	11	100	100	2	7	8	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	10	34	35	4	0	65	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	11	100	100	2	7	8	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	10	31	35	4	0	29	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	10	81	85	4	0	119	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	10	100	60	7	100	167	100	4	41	108	0	0	0	0	0	0	0	0
34	0	0	10	100	75	7	118	185	100	4	41	132	0	0	0	0	0	0	0	0
35	0	0	10	100	100	1	23	202	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	10	100	100	7	88	201	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	11	100	100	7	76	200	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	11	100	95	7	118	185	100	4	53	120	0	0	0	0	0	0	0	0
39	0	0	11	100	35	4	65	132	100	4	0	48	0	0	0	0	0	0	0	0
40	0	0	11	100	60	7	110	177	40	4	65	132	100	4	0	48	0	0	0	0
41	0	0	11	100	15	7	94	161	100	4	0	106	0	0	0	0	0	0	0	0
42	0	0	11	95	45	7	105	172	95	4	0	129	0	0	0	0	0	0	0	0
43	0	0	11	92	60	7	105	172	90	4	5	129	0	0	0	0	0	0	0	0
44	0	0	11	100	100	7	83	190	10	4	50	117	0	0	0	0	0	0	0	0
45	0	0	11	100	100	7	114	201	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	11	100	100	7	83	199	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	11	100	50	7	105	172	100	4	0	129	0	0	0	0	0	0	0	0
48	0	0	11	100	55	7	105	172	100	4	5	106	0	0	0	0	0	0	0	0
49	0	0	11	100	100	4	49	116	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	11	90	45	7	80	147	90	4	0	105	0	0	0	0	0	0	0	0
51	0	0	11	60	60	4	0	105	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	11	100	100	4	5	116	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	11	100	100	4	0	48	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	11	100	85	7	102	169	100	4	0	116	0	0	0	0	0	0	0	0
55	0	0	11	100	100	7	70	197	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	11	100	100	7	80	197	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	11	98	65	9	190	205	95	7	115	201	0	0	0	0	0	0	0	0
58	0	0	11	100	100	1	23	206	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	11	98	100	1	23	206	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	11	95	95	1	23	206	0	0	0	0	0	0	0	0	0	0	0	0

RTNeph Embedded SpreadTo Pts for Box 45 JAN 149880

i	j	FW	Vis	Tf	TC	Layer 1 Amt	Typ	Bas	Top	Layer 2 Amt	Typ	Bas	Top	Layer 3 Amt	Typ	Bas	Top	Layer 4 Amt	Typ	Bas	Top
1	5	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	7	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	8	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	9	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	10	38	4	8	100	100	2	9	19	0	0	0	0	0	0	0	0	0	0	0	0
1	11	38	4	8	100	100	2	9	19	0	0	0	0	0	0	0	0	0	0	0	0
1	12	0	61	8	100	100	10	200	208	90	7	88	143	90	3	26	91	0	0	0	0
1	13	0	61	8	100	100	10	200	208	90	7	88	143	90	3	26	91	0	0	0	0
1	14	0	61	8	100	100	10	200	208	90	7	88	143	90	3	88	91	0	0	0	0
1	15	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
1	19	76	48	0	100	100	3	18	78	0	0	0	0	0	0	0	0	0	0	0	0
1	30	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	31	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	32	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	33	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	35	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	36	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	37	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	38	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	39	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	40	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	41	2	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	43	0	64	0	87	90	8	209	212	90	5	127	160	90	2	31	41	0	0	0	0
1	44	2	74	0	12	10	7	181	188	0	0	0	0	0	0	0	0	0	0	0	0
1	45	2	74	0	12	10	7	181	188	0	0	0	0	0	0	0	0	0	0	0	0
1	46	65	80	231	87	90	8	209	212	90	5	125	158	90	2	23	33	0	0	0	0
1	47	65	80	231	87	90	8	209	212	90	5	125	158	90	2	23	33	0	0	0	0
1	49	0	74	231	87	90	8	210	213	90	5	132	165	90	2	38	48	0	0	0	0
1	51	0	80	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	53	0	74	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	54	0	74	231	25	10	8	211	214	10	5	136	169	10	2	40	50	0	0	0	0
1	57	0	61	231	25	10	8	211	214	10	5	135	168	10	2	39	49	0	0	0	0
1	58	0	61	231	25	10	8	211	214	10	5	135	198	10	2	39	49	0	0	0	0
1	59	0	80	231	87	50	8	211	214	50	5	133	166	50	2	37	47	0	0	0	0
1	60	0	74	231	100	100	5	106	139	0	0	0	0	0	0	0	0	0	0	0	0
1	62	0	83	231	25	10	8	210	213	10	5	124	157	10	2	28	38	0	0	0	0
1	63	0	74	231	100	100	5	108	141	0	0	0	0	0	0	0	0	0	0	0	0
1	64	0	74	0	87	50	8	210	213	50	5	125	158	50	2	29	39	0	0	0	0
2	5	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	8	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	38	4	8	100	100	2	9	19	0	0	0	0	0	0	0	0	0	0	0	0
2	11	38	4	8	100	100	2	9	19	0	0	0	0	0	0	0	0	0	0	0	0
2	13	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
2	14	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
2	15	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
2	16	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
2	17	76	48	0	100	100	3	15	75	0	0	0	0	0	0	0	0	0	0	0	0
2	18	76	48	0	100	100	3	18	78	0	0	0	0	0	0	0	0	0	0	0	0
2	19	76	48	0	100	100	3	18	78	0	0	0	0	0	0	0	0	0	0	0	0
2	20	76	48	0	100	100	3	18	78	0	0	0	0	0	0	0	0	0	0	0	0
2	21	76	48	0	100	100	3	18	78	0	0	0	0	0	0	0	0	0	0	0	0
2	28	1	66	0	62	60	3	33	93	0	0	0	0	0	0	0	0	0	0	0	0
2	30	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RTNeph Embedded SpreadTo Pts for Box 45 JRN 149280

i	j	BOGUS FLG	B R FLG	SPD FLG	VIS DAT	I R DAT	LOW CLD	CLR/W CLD	F/M OVR	T DEC	B R RAO	B R F	B R SRF	NBO ICE	SNO FLG	TRO PIC	I R DAY	I R SUN	VIS DAY	VIS SUN	VIS SOC	I R SATID	VIS SATID
1	5			1									1	1			1	1	1	1		2	2
1	6			1									1	1			1	1	1	1		2	2
1	7			1									1	1			1	1	1	1		2	2
1	8			1									1	1			1	1	1	1		2	2
1	9			1									1	1			1	1	1	1		2	2
1	10			1									1	1			1	1	1	1		2	2
1	11			1									1	1			1	1	1	1		2	2
1	12	1		1									1	1			1		1			2	2
1	13	1		1									1	1			1		1			2	2
1	14	1		1									1	1			1		1			2	2
1	15			1									1	1			1	1	1	1		2	2
1	16			1									1	1			1	1	1	1	1	2	2
1	30			1									1		1		1	1	1	1	1	2	2
1	31			1									1		1		1	1	1	1	1	2	2
1	32			1									1		1		1	1	1	1	1	2	2
1	33			1									1		1		1	1	1	1	1	2	2
1	35			1									1		1		1	1	1	1	1	2	2
1	36			1									1		1		1	1	1	1	1	2	2
1	37			1									1		1		1	1	1	1	1	2	2
1	38			1									1		1		1	1	1	1	1	2	2
1	39			1									1		1		1	1	1	1	1	2	2
1	40			1									1		1		1	1	1	1	1	2	2
1	41			1									1				1	1	1	1	1	2	2
1	43			1									1		1		1	1	1	1	1	2	2
1	44			1									1		1		1	1	1	1	1	2	2
1	45			1									1		1		1	1	1	1	1	2	2
1	46			1									1		1		1	1	1	1	1	2	2
1	47			1									1		1		1	1	1	1	1	2	2
1	48			1									1		1		1	1	1	1	1	2	2
1	51			1									1		1		1	1	1	1	1	2	2
1	53			1									1		1		1	1	1	1	1	2	2
1	54			1									1		1		1	1	1	1	1	2	2
1	57			1									1		1		1	1	1	1	1	2	2
1	58			1									1		1		1	1	1	1	1	2	2
1	59			1									1				1	1	1	1	1	2	2
1	60			1									1				1	1	1	1	1	2	2
1	62			1									1				1	1	1	1	1	2	2
1	63			1									1				1	1	1	1	1	2	2
1	64			1									1				1	1	1	1	1	2	2
2	5			1									1	1			1	1	1	1		2	2
2	6			1									1		1		1	1	1	1		2	2
2	7			1									1		1		1	1	1	1		2	2
2	8			1									1	1			1	1	1	1		2	2
2	9			1									1	1			1	1	1	1		2	2
2	10			1									1	1			1	1	1	1		2	2
2	11			1									1	1			1	1	1	1		2	2
2	13			1									1	1			1	1	1	1		2	2
2	14			1									1	1			1	1	1	1		2	2
2	15			1									1	1			1	1	1	1		2	2
2	16			1									1		1		1	1	1	1		2	2
2	17			1									1		1		1	1	1	1	1	2	2
2	18			1									1		1		1	1	1	1	1	2	2
2	19			1									1		1		1	1	1	1	1	2	2
2	20			1									1	1			1	1	1	1	1	2	2
2	21			1									1	1			1	1	1	1	1	2	2
2	22			1									1		1		1	1	1	1	1	2	2
2	30			1									1		1		1	1	1	1	1	2	2

i	j	Layer 1								Layer 2								Layer 3								Layer 4							
		LoP	BEs	TEs	BAR	BRP	BRS	VSa	ISa	LoP	BEs	TEs	BAR	BRP	BRS	VSa	ISa	LoP	BEs	TEs	BAR	BRP	BRS	VSa	ISa	LoP	BEs	TEs	BAR	BRP	BRS	VSa	ISa
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1	47			1			1					1			1					1			1										
1	48			1			1					1			1					1			1										
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2	19			1			1																										
2	20			1			1																										
2	21			1			1																										
2	22			1			1																										
2	30																																

Appendix C – Running RDMRG

Two distinct versions of RDMRG exist on the AIMS network. Version 1.0, in [NEF_ROOT.OLDMRG], accesses files of conventional reports, the terrain/geography file, and a file of processing parameters from [NEF_ROOT.BRDAT]. After the conventional-report nephanalysis is performed, the program writes the full nephanalysis file and an abstracted total-cloud field to the same directory. This version of RDMRG presents its results as 'printer-plotter' representations, as in Figures (1a-d) and (2a-e).

Version 2.0, in [NEF_ROOT.RDMRG], performs all data access through the Nephanalysis Data Base (NDB). Three new NDB 'types' were instituted for this purpose: 'CRep', code 12, is an eighth-mesh *gridded* representation of the conventional reports, 'CNef', code 1004, is the conventional-report nephanalysis, and 'CRTc', code 1005, is the total cloud field for the conventional-report nephanalysis, abstracted for compactness. When operating version 2.0, a representation of the conventional-report total cloud superimposed over the terrain/geography field is displayed on the Adage image processor, the conventional-report propagation occurs, the conventional-report nephanalysis is displayed on the Adage, and the user is asked to decide whether to retain either the nephanalysis or its abstracted total-cloud field. Nothing is written to the NDB without specific approval.

Both versions of the program are executed in similar fashion.

1) Set the appropriate default directory – [NEF_ROOT.OLDMRG] for Version 1.0, or [NEF_ROOT.RDMRG] for Version 2.0.

2) Invoke

   @RDMRG 3D

   for 3DNeph-style processing (pre-83212), or

   @RDMRG RT

   for RTNeph-style processing (post-83212). The procedure will prompt for the parameter if it is omitted.

3) Both versions prompt for the appropriate case-study day: currently defined possibilities are 82162 and 85010.

4) The RTNeph 'flavor' of Version 1.0 will prompt for the Julian Reference Time: supply the value '149280'.

5) For both versions, the 3DNeph 'flavor' may print a number of messages of the following form to the terminal:

   DISSAM -- Spread conflict incompletely resolved.
   Spreading from [i1], [j1] to [i2], [j2]

These occur when two or more conventional reports could be propagated to the same 'empty' grid point, and the 'timeliness' and 'total cloud' criteria are insufficient to decide between them. The default behavior is to propagate the first – lowest-indexed – candidate encountered. This ambiguity does not arise when processing RTNeph-style data. Here, in cases of equal timeliness and total cloud, the report with the greatest visibility is used.

References

1. *The AFGWC Automated Real-Time Cloud Analysis Model*, Kiess & Cox, AFGWC TN-87/002 (September 1987), Air Force Global Weather Central, Offutt AFB, NE 68113;

2. *The AFGWC Automated Cloud Analysis Model*, Falko K. Fye, AFGWC TM 78-002 (June 1978), Air Force Global Weather Central, Offutt AFB, NE 68113;

3. *Comparison Between the RTNEPH and AFGL Cloud Layer Analysis Algorithms*, d'Entremont et. al., Hanscom AFB, MA 01731-5000, GL TR 89-0175 (15 July 1989), ADA216637;

4. *The Data Format Handbook*, AFGWC (May 1987), Air Force Global Weather Central, Offutt AFB, NE 68113.